

# Depression among Secondary School Students: a Comparison between Urban and Rural Populations in a Malaysian Community

## 馬來西亞市區和農村地區中學生患抑鬱情況的比較

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### Abstract

**Objectives:** To study the prevalence of depression among secondary schoolchildren in Selangor, and compare the same in urban and rural schools; also to identify factors associated with depression in secondary schoolchildren.

**Participants and Methods:** Two urban and 3 rural secondary schools were selected by 2-staged stratified random sampling, so as to represent the population of secondary schoolchildren in the state of Selangor, Malaysia. A total of 2,048 schoolchildren were enrolled and the level of depression was measured by a self-rated scale — the Children's Depression Inventory.

**Results:** The prevalence of possible depression in these students was 10.3%. There was no difference in the prevalence of significant depressive symptoms between rural and urban schoolchildren. Factors associated with depression were being female, Chinese, parents with low education level, stealing, and alcohol abuse ( $p < 0.001$ ). Depression contributed significantly to suicidal tendencies ( $p < 0.001$ ).

**Conclusions:** A sizable proportion of children in this secondary school population potentially suffered from depression. Psychological interventions are needed to ease this burden and ensure their well-being.

**Key words:** Adolescent; Depression; Prevalence; Students

### 摘要

**目的：**檢視在馬來西亞雪蘭莪州學童患抑鬱的現患率，把市區和農村學童作比較，且分析與中學學童患抑鬱的相關因素。

**參與者與方法：**以兩個階段的分層隨機抽樣方法，於兩所市區和三所農村中學選出研究對象，代表雪蘭莪州的研究人口。合共2048名學童參與研究，並以自我評分的兒童抑鬱量表評估抑鬱程度。

**結果：**可能患抑鬱學生的現患率佔10.3%。農村和市區學童在明顯抑鬱症狀的現患率上並沒有分別。女性、華籍、父母有較低的教育水平、偷竊和酗酒（ $p < 0.001$ ）皆為患抑鬱的相關因素；也是導致有自殺傾向的明顯因素（ $p < 0.001$ ）。

**結論：**是項研究中受抑鬱影響的兒童為數不少。減輕孩童病情和確保他們健康的心理治療是需要的。

**關鍵詞：**青少年、抑鬱、現患率、學生

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**Submitted:** 17 July 2007; **Accepted:** 23 August 2007

### Introduction

Childhood depression is a matter of major concern because

of its prevalence, potential for recurrence, and impairment of functioning. Depressive episodes in childhood depression are recurrent and may lead to depression in adulthood, if the contributing factors remain unabated. Early depressive vulnerability is a predictive factor for depression in adulthood.<sup>1</sup> Depressive disorders occur in approximately 2% of primary schoolchildren, and 4 to 8% of adolescents.<sup>2,3</sup> About 45% of adolescents with major depression will relapse in young adulthood.<sup>4</sup> Children and adolescents with depression are also at increased risk of suicide, substance use disorders, early pregnancy, poor academic performance, and impaired psychosocial functioning.<sup>5-7</sup>

Psychosocial problems associated with being depressed are relatively well known in adults. However, the extent to which these characteristics associate with depression in adolescents has received much less attention.<sup>8</sup> Stressful life events, cognitive distortion, low self-esteem, increased self-consciousness, reduced social support, and impaired coping skills were among factors associated with depression.<sup>9,10</sup> Although previous studies vary greatly in their methodology and focused on adults, sufficient convergence has emerged to implicate the following variables as potential risk factors for depression: previous history of depression; female gender; living in a dysfunctional family; low parental education; stressful life events and low social support; cigarette smoking; low self-esteem and body image; high self-consciousness; depression-related cognitions; school problems and reduced intellectual competence and coping skills; physical disability and poor physical health; excessive interpersonal dependence; problematic interpersonal behaviours; conflict with parents; and early death of a parent.<sup>11-14</sup> Moreover, although many risk factors have been proposed and studied, relatively few have been examined systematically.

This study was undertaken because there is insufficient information pertaining to the mental health of Malaysian children. Not surprisingly, little has been mentioned regarding services to assist these children and their families, though they are invariably the main target of available social support systems. The main objective of this study was to determine the prevalence of clinically significant depressive symptoms among schoolchildren in Selangor and to compare urban and rural areas from this perspective. The study also aimed to determine factors associated with depression in these children.

## Methods

### *Sampling Frame and Recruitment Centres*

This was a cross-sectional pilot study to antedate a nationwide study across Malaysia. Selangor is one of the developed states in Malaysia, and was chosen for geographical and logistic reasons. According to the Department of Statistics of Malaysia, in 2000 about 30% of the 4.5 million Selangor inhabitants were adolescents. A 2-stage stratified random sampling was used to select the schools to represent Selangor schools, taking account of geographical factors relevant to

urban and rural areas. The Ministry of Education gave full permission for the study to commence. Written consent was obtained from the parents and subjects after the procedures had been fully explained.

### *Subjects*

In all, 2,048 students from 2 urban secondary schools (SMK Sri Permata and SMK Kelana Jaya, Petaling Jaya) and 3 rural secondary schools (SMK Sungai Pelek Sepang, Sekolah SMK Sri Tanjung Kuala Selangor, and SMK Sultan Abdul Aziz, Kuala Selangor) were selected to participate in the study. Inclusion criteria were ability to converse in English or Bahasa Malaysia, and provision of written consent to participate in this study.

### *Procedures*

The Children's Depression Inventory (CDI) is a self-administered questionnaire.<sup>15</sup> The Bahasa Malaysia version of the CDI has been validated in Malaysia; it has a Cronbach's alpha of 0.83, a sensitivity of 93%, and a specificity of 96% (personal communication, Rosliwati MY, 23 July 2007), indicating that it was a reliable and acceptable version. A cut-off point of 65 on T-score was used as recommended by CDI technical manual.<sup>15</sup> Those who scored a T-score of 65 and above were considered possibly depressed. In the past, there were about 25 studies that used the CDI as a screening tool and it was widely demonstrated to be effective at differentiating between depressed and non-depressed children.<sup>15</sup> Prior to the distribution of the questionnaire, the students were briefed and supervised by facilitators.

### *Statistical Analysis*

Demographic data, severity of depressive symptoms, and factors associated with depression were analysed by Chi-square and general linear model procedures, using the Statistical Package for the Social Sciences (Windows version 11.0; SPSS Inc, Chicago [IL], US). The questionnaire also contained a few items measuring quality of relationships with parents, siblings, teachers, and schoolmates, and involvement in unwanted activities. These data were analysed by Chi-square tests.

## Results

### *Socio-demographic Data*

Table 1 shows the demographics in urban and rural students. All demographic variables revealed statistically significant differences ( $p < 0.05$ ), especially with respect to socio-economic status (including family income levels and parental education), and consistent with expected differences.

### *Frequency of Possible Depression*

Two hundred and eleven children (10.3%) scored a T-score of 65 and above on the CDI, and were considered screened-positive with respect to possible depression; 98 (9.8%) were urban students and 113 (10.8%) were rural students. However, further evaluation would be needed to confirm

**Table 1. Socio-demographic variables of the students.**

Variable	Urban (n = 1,005)	Rural (n = 1,043)	p Value*
Median age (years)	14	15	0.001
Sex			
Male	567 (56.4%)	471 (45.2%)	0.001
Female	438 (43.6%)	572 (54.8%)	
Race			
Malay	538 (53.5%)	478 (45.8%)	0.001
Chinese	245 (24.4%)	340 (32.6%)	
Indian	213 (21.2%)	223 (21.4%)	
Others	9 (0.9%)	2 (0.2%)	
Parents' education level			
Refused to answer	15 (1.5%)	27 (2.6%)	0.001
None	33 (3.3%)	71 (6.8%)	
Primary	59 (5.9%)	183 (17.5%)	
Secondary	520 (51.7%)	592 (56.8%)	
College	97 (9.7%)	67 (6.4%)	
University	281 (28.0%)	103 (9.9%)	
Type of dwelling			
Refused to answer	3 (0.3%)	23 (2.2%)	0.001
Bungalow / single	119 (11.8%)	238 (22.8%)	
Semi-detached	98 (9.8%)	73 (7.0%)	
Terrace house	481 (47.9%)	614 (58.9%)	
Flats	241 (24.0%)	40 (3.8%)	
Slum area	63 (6.3%)	55 (5.3%)	
Family income			
Low-income group	394 (39.2%)	717 (68.7%)	0.001
Middle-income group	318 (31.6%)	129 (12.4%)	
High-income group	189 (18.8%)	27 (2.6%)	
Refused to answer	104 (10.3%)	170 (16.3%)	
Number of children			
1-2	69 (6.9%)	46 (4.4%)	0.001
>2	936 (93.1%)	997 (95.6%)	
Staying with			
Both parents	833 (82.9%)	917 (87.9%)	0.001
Single parent	129 (12.8%)	80 (7.7%)	
Others	43 (4.3%)	46 (4.4%)	

\* All by Chi-square.

whether they fulfilled the criteria for major depressive disorder. The relative risks for urban and rural students being depressed were 0.90 (95% confidence interval [CI], 0.70-1.16) and 1.10 (95% CI, 0.88-1.25), respectively. There was no major difference in the prevalence of possible depressive cases in the urban and rural areas. According to CDI technical manual,<sup>15</sup> the test has been used frequently as a screening tool for depression. Therefore we extrapolated that the prevalence of depression among the subjects was 10.3%. Further analysis of CDI subscales revealed that 9.2% of the subjects had negative mood, 5% had interpersonal problems, 8.3% had ineffectiveness, 4.6% had anhedonia, and 10.6% had negative self-esteem.

### **Factors Associated with Children's Depression Inventory Scores**

The general linear model univariate procedure was used to determine factors that were associated with depression

among secondary schoolchildren. Based on Table 2, the mean CDI scores differ significantly between males and females, and with respect to races, parents' education and income levels ( $p < 0.001$ ), and the number of children in the family ( $p = 0.014$ ). Further analysis showed that the mean depressive scores for females and Chinese as opposed to Malay and Indian students were significantly higher. There was no significant difference in scores between students of Malay, Indian, and other races. Those from lower socio-economic groups also had a higher mean score for depression. Students whose parents had no schooling or had primary schooling showed significantly higher mean scores compared to those whose parents had received secondary or tertiary education. Further analysis of the data showed that quality of relationships with parents, siblings, teachers, and schoolmates played a significant role in the pattern of CDI scores. The mean scores for depression were significantly higher in the group with poor relationships with parents,

**Table 2. Factors associated with depression scored by the Children's Depression Inventory (CDI).**

Factor	Number	Mean CDI score	Standard error	p Value
Sex				
Male	1,038	51.4	0.991	<0.001
Female	1,010	54.0	0.995	
Race				
Malay	1,016	53.6	0.687	<0.001
Chinese	585	54.8	0.726	
Indian	436	51.3	0.757	
Others	11	51.1	3.097	
Parents' education level				
None	104	54.9	1.439	<0.001
Primary	242	53.5	1.151	
Secondary	1,112	51.3	0.976	
Tertiary	548	51.1	0.996	
Family income				
Low-income group	1,111	54.0	0.953	<0.001
Middle-income group	447	52.2	1.050	
High-income group	216	51.8	1.190	
Number of children				
1-2	347	52.3	1.053	0.014
>2	1,692	53.1	0.988	
Living with				
Both parents	1,750	51.9	0.887	0.208
Single parent	209	53.0	1.102	
Others	78	53.2	1.504	

**Table 3. Relationships between the Children's Depression Inventory (CDI) scores and 'undesirable' habits.**

Undesirable habit	Number	Mean CDI score	Standard error	p Value
Smoking	146	57.0	1.425	0.515
Non-smoking	1,902	56.4	1.347	
Gum sniffing	33	55.2	1.878	0.153
Not gum sniffing	2,015	58.1	1.415	
Drug abuse	19	58.6	2.411	0.152
No drug abuse	2,029	54.7	1.164	
Alcohol abuse	83	58.8	1.543	< 0.001
No alcohol abuse	1,965	54.5	1.334	
Stealing	203	58.0	1.375	< 0.001
Not stealing	1,845	55.4	1.359	

siblings, schoolmates, and teachers ( $p < 0.001$ ).

Five 'undesirable' habits were tested in this study (smoking, gum sniffing, drug abuse, alcohol abuse, and stealing). Of the 2,048 students, 7.1% were smokers, 1.6% were sniffing gum, 0.9% were involved in drug abuse, 4.1% took alcohol, and 9.9% were engaged in stealing. Table 3 shows the correlations between these habits and the level of depression; the mean CDI score for those imbibing alcohol was significantly higher than those who abstained. Similarly, those in the habit of stealing from others recorded significantly higher mean scores than those who did not. In conclusion, students who took alcohol and admitted stealing had significantly higher levels of depression than their peers. Although those who smoked and abused drugs had higher mean depression level scores, the differences were

not statistically significant. Furthermore, the mean CDI scores increased with increasing level of suicidal tendency ( $p < 0.001$ ).

Multivariate analyses of all confounders of depression revealed socio-economic variables such as parental income and level of education, number of siblings per family and type of dwelling, relationship with parent's careers, and low self-esteem to be significant contributing factors for depression (Table 4).

## Discussion

This study revealed that the prevalence of possible depression among the subjects was 10.3%, which is higher than the figure for all psychiatric morbidities obtained in

**Table 4. Multivariate analyses of possible confounders for the level of depression among the schoolchildren.**

Variable	Degree of freedom	p Value
Parents' income	1	0.001
Parents' education	1	0.001
Number of siblings	1	0.017
Type of dwelling	1	0.001
Relationship with parent's career	1	0.032
Relationship with siblings	1	0.038
Relationship with teachers	1	0.172
Relationship with school friends	1	0.371
Self-esteem	1	0.001
Smoking	1	0.671
Gum sniffing	1	0.364
Drug abuse	1	0.057
Alcohol abuse	1	0.768
Stealing	1	0.620

Malaysian National Health and Morbidity Survey (8.7% for the state of Selangor).<sup>16</sup> Another comparison by Kasmini et al<sup>17</sup> in rural areas of Selangor (Jeram) revealed a rate of 15% as compared to 10.8% in this study (prevalence for the rural population in general). Thus, there appeared to be about a 4.2% fewer depressed subjects in rural Selangor after a 20-year interval. Several factors could explain this difference. First, the Reporting Questionnaire for Children was used in the two prior studies, while in the present study the CDI was used. The latter was cited in several studies in the past as a screening tool; substantially high scores indicate depression. Lowering the cut-off value reduces its sensitivity but increases specificity. In this study, a T-score of 65 or greater is used to identify possible depressive cases.<sup>15</sup> Second, there was a considerable interval between this and the prior studies, which may explain the difference in prevalence for depression. Finally, the other 2 studies were conducted in the general population and looked at general psychiatric morbidities, whereas the present one focused only on secondary schoolchildren.

This finding was fairly similar to results from 2 other studies from Scandinavia and Italy<sup>18,19</sup>; in both studies, 10% of the children were depressed. In the United States, the prevalence of major depressive disorder was approximately 5 to 8% in adolescents.<sup>20</sup> The prevalence of depression appeared to be increasing in successive generations of children, with onset at earlier ages.<sup>21</sup>

In this study, there was no major difference in the prevalence of possible depression between rural and urban students, though it was slightly higher in the former (10.8% vs 9.8%). Rutter et al,<sup>22</sup> who undertook a vast population study comparing rural (Isle of Wight) and urban (Inner London) areas, found that the prevalence of depression

in children was clearly higher in urban (13%) than rural areas (6-8%), possibly because the assessments were not conducted simultaneously in all schools. In particular, rural schools provided their data later, consistent with on-going events influencing the scoring of depression, especially major school examinations. Although there were no major examinations during the process of subject recruitment in our Selangor study, there were a few small tests for the rural students that might have influenced their mood.

In this study, girls were significantly more depressed than boys, which was consistent with other studies in the past. A study in Italy<sup>21</sup> and another study by Chartier and Lassen<sup>23</sup> found that girls had significantly more depressive symptoms than boys. Another report from Brazil<sup>24</sup> suggested significantly more females than males had scores above the cut-off point for depression (72.3% vs 27.7%), as did a study among Chinese secondary schoolchildren in Hong Kong (aged 13-17 years).<sup>25</sup> Regardless of age, females are generally more susceptible to depression, due to patterns of help-seeking behaviours and multiple life events. Before the age of 13 years, the prevalence of childhood depression was equal between genders, but increased significantly in females after they reached the age of 14 years,<sup>26</sup> although this was not a uniform finding. In studies by Finch et al<sup>27</sup> and Huntley et al,<sup>28</sup> boys were significantly more depressed than girls based on the CDI. Among the races, Chinese recorded a significantly higher mean T-score compared to other races (Malays, Indians, and others). In Malaysia, Chinese generally had higher socio-economic status as well as higher income level than others. The prevalence of depression should therefore have been lower. Our contrary findings might be due to Chinese individuals being more open about revealing their feelings than others.

In major epidemiological studies, prevalence of depression was found to be much higher among adolescents of low socio-economic status.<sup>3,14</sup> The indicators of low socio-economic status were low levels of parental education, low parental income, and high economic burdens, such as high number of siblings per family. This study found that students with the above-mentioned factors were significantly more depressed. Depression among adolescents was also significantly associated with family dysfunction (single parents, divorced parents<sup>29</sup>) and poor social support.<sup>30</sup> Prior studies concluded that between 25% and 32% of children who had lost one or both parents due to death, divorce, or separation were depressed.<sup>30,31</sup> Our study also revealed that students who had poor relationships with their social network such as family, schoolmates, and teachers were more depressed. However, surprisingly the level of depression was not influenced by factors such as whether they stayed with one or both parents, though whether they were divorced was not specifically addressed. In Malaysia, it is quite common for fathers in rural areas to leave their families, to seek better-paid jobs in a big city or urban area, whilst still retaining emotional ties and supports for their families.

Students involved in drinking alcohol and stealing had

significantly higher levels of depressive symptoms than those who were not, and those who smoked and took drugs also had higher mean scores for depression, but the latter differences were not statistically significant. In other studies, substance use has been recorded in approximately 25% of adolescents with depression.<sup>25,32</sup> Depressed adolescents had a tendency to express their emotional incompetence by displaying externalising behaviours such as substance abuse.

Not surprisingly, those who were depressed were more prone to suicidal thoughts compared to those who were not. Suicide has become a growing public health concern, as successive generations have shown a parallel increase in suicide and depression in the paediatric age-group.<sup>10,21</sup> Another study conducted on 79 male and 44 female inpatient children (aged 6-13 years) found that suicidal ideations were reported significantly more often among those with high depressive levels, high levels of hopelessness, and low self-esteem.<sup>33</sup> Depression as measured by the CDI was the single best predictor of suicidal ideation and suicidal attempts.<sup>34</sup>

This study, which used a self-rated questionnaire only, did not entail second party verification of the depressive symptoms. In studies involving children, it is generally recommended to obtain second opinions, especially from parents or teachers. In acquiring information from children, they are bound to have recall bias, which includes misreporting or underreporting of symptoms. This issue should be highlighted and overcome in future larger studies so as to minimise recall bias. The validity of the Malay version is yet to be ascertained on a larger scale in the future. However our limited data show that its validity and reliability was good. There is also an issue regarding the validity of acquiring data about involvement in drugs via single party information (without further verification from parents). Other confounders such as recent adverse life events might hinder the results and was not looked into in this study. Recent life events such as parental loss and examinations influence children in particular, and could have a strong psychological impact. Researchers who are interested in this area should replicate this investigation, and include more questions on adverse life events.

The high frequency of possible depression in this population requires therapeutic and preventive interventions, and parents, teachers, and health care providers should heed the problem. Crucially, undiagnosed childhood depression may lead to various long-term, detrimental psychosocial consequences such as substance abuse, school dropout, suicide, and depression in adulthood. Childcare providers must be equipped with knowledge, attitudes, and skills to help these children cope with their emotions and stresses. In particular, 'difficult children' or those involved with disciplinary or conduct problems might be suffering from childhood depression.

## Acknowledgements

We wish to extend our heartfelt gratitude to all students who participated in this study and to all their dedicated teachers

for their cooperation.

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## Corrigenda

“Does the Public Health Approach to Suicide Prevention and Treatment Work?” (June 2006;16:34-5). On page 34, information of the author should have read “*Mr Jackie Ying-Wat Cheng, Department of Psychiatry, Queen Mary Hospital, Pokfulam Road, Hong Kong, China*” rather than “*Dr Jackie Ying-Wat Cheng, MBBS, Department of Psychiatry, Queen Mary Hospital, Pokfulam Road, Hong Kong, China*” as printed; and address for correspondence should have read “*Mr Jackie Ying-Wat Cheng*” rather than “*Dr Jackie Ying-Wat Cheng*” as printed.

“A Survey on Same-sex Attraction in Secondary School Adolescents: Prevalence and Psychosocial Factors” (March 2008;18:15-22). On page 15, the Chinese name of Dr AY Leung should be “梁豔枝” rather than “梁豔姿” as printed.